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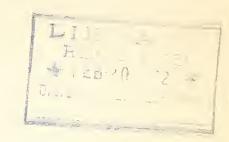
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THE EXTENSION HORTICULTURIST

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SPECIAL NOTICE

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Office of Horticultural and Pomological Investigations and States Relations Service Cooperating.

U. S. Department of Agriculture,

Washington, D. C.

by Prof. L. C. Corbett.

European Horticulture was the subject of an interesting report by Prof. L. C. Corbett at the November 24th conference of horticultural and pomological project leaders of the Department. Prof. Corbett spoke in part as follows:

Landing at Antwerp we visited the bulb growing regions of Holland also the nursery section and later the intensive market garden section near The Hague. Here we find scores of glass houses of modern type of construction with high eaves and solid beds which are used for growing tomatoes, cucumbers and European grapes. Strange as it may seem the surplus products of these houses are on the English markets in direct competition with the products of the forcing houses of England.

Mention should be made of the fact that the various branches of horticultural activity in Europe are located around definite centers and each section is devoted almost exclusively to one particular line of production. One section will be devoted to nursery, another to bulb growing, another to the production of a particular kind of seeds, in other words, specialization is the rule. Leaving Holland we visited Southern England. From England we went to France where most of our time was spent in the outlying small cities around Paris.

I take for granted that you will be especially interested in the institutions that I visited and in their methods of organizing their work. The European war has undoubtedly had a very great influence upon the institutions of England and France, although I was surprised to find them in as good condition as they really are. One thing that struck me forcibly was the atmosphere of permanence that characterizes the work being done by these institutions, especially those in England. Everything seems to be conducted after a definite and well formed plan. The work is particularly characterized by the absence of haste to arrive at results. The men conducting the work are going about it in a definite, careful, businesslike manner, with their whole attention being concentrated on the piece of work in hand.

In England we first visited the East Malling station located near Wye College, a few miles south and a little east of London. The work of this station is in charge of Prof. R. G. Hatton. Located at this station is Mr. N. H. Grubb, who was at one time connected with the United States Department of Agriculture. This is a new station and in its organization follows the custom of the English Government, by which all field activities of this character are made cooperative. Under this arrangement the establishment and management of the station are cooperative with the local farm interests. In the case of the Bast Malling station the local people have

evidently supplied the land and a large part of the funds for the buildings. A small area of probably 20 acres has been in use for 8 or 10 years, but recently about 120 acres of additional land has been purchased.

The work of the East Malling station is devoted to the problems of the horticultural industries of the surrounding region, prominent among which are the fruit industries, hop raising, and vegetable growing. The fruits include mainly apples, sweet cherries, plums, and small fruits. Large hop plantations are found within 30 or 40 miles of London in Kent County and hop breeding work is being carried on at the East Malling station. Sweet cherries are an important crop in this section. Apples, plums, and small fruits are also grown extensively. Seedling stocks are not used to any extent in the propagation of fruit trees in England. Practically all of the trees are double worked. At the East Malling station special investigations of the vegetative propagation of apple and other stocks are being conducted. English horticulturists use the word "standard," but in actual practice they use two or three special words to designate the type of fruit. They have in practically all their orchards small fruits planted in rows between the standard fruits, these being called "under fruit" and the standard fruit being called "over fruit" or "top fruit."

The work that Prof. Hatton is doing at the East Malling station is not so very extensive but is very excellent in character. He has brought together fruit stocks from all parts of France, Germany, Holland, and England and has practically established pure strains of these stocks. He now has these stocks in sufficient quantity so that he is beginning to put them into the hands of the nurserymen. There is one interesting thing in connection with the vegetative propagation of these stocks that I do not know exactly how to interpret and which the English use to determine the plants which will most easily and satisfactorily form roots. This point is in connection with the extraneous or warty growths along the stem and they say that an apple tree that shows this character will throw out roots very readily and in selecting propagation stock they choose those plants with such projections, provided they are not too knobby or large. One peculiar thing about the root system of the plants propagated in this manner is that is made up largely of a great number of fibrous roots 8 or 10 inches long instead of four or five spreading roots as we have in the case of our stocks. The English nurserymen like a mass of fibrous roots. It may be that the use of this vegetatively propagated stock does not influence the size of the trees to any extent but I suspect that they are not very long lived. Cherry orchards which I saw in Kent County are 60 years old, but cherries are not so extensively propagated by the vegetative process as are apples. The apple orchards that I saw give the appearance of being about 10 or 15 years old. This may be a supposition on my part but I do know that after a plantation of apples has run for a reasonable time they replace it. Unpruned apple trees that are 18 months old were observed to have 3 or 4 fruits on them. In the case of those which had been pruned the fruiting habit was delayed for a considerable period, sometimes 3 or 4 years. One one fruit plantation I observed trees in adjoining rows pruned and unpruned, those which had not been pruned having reached the fruiting period earlier. The interesting thing to me was that the unpruned trees have a larger number of more highly colored fruits upon them. The extent to which climatic conditions or the stock upon which they are grown influence the color of the fruit I am unable to say, but the fact is these trees have under them the

\$ 1.75 miles 534 \$30 p. 150 same stock so pruning was the only factor that was under control. There was, however, a very marked difference in the size of the fruit and the stage of ripeness at the time I saw it.

In response to a question Prof. Corbett said that the vegetative propagation of apples and other fruits offers more promise to those persons who are conductary investigational work than it does to the commercial grower. I am not sure that it has much in it for our commercial growers until further tested.

The Long Ashton research station, known as the sider institute, near Bristol, England was another of the interesting places visited. This station has about 270 acres of land with suitable laboratory facilities and is an order institution than the Bast Malling station. At this station is perhaps the largest and most complete collection of cider crab apples in Europe. This collection is used as a basis for the study of cider manufacture and the blending of varieties in the manufacture of cider so as to produce a standardized product, comparable with the famous ciders of Normandy, France. Fruit utilization in a much more comprehensive way will be taken up from now on and the work with juices, jams, marmalade and canning will be included.

I was particularly struck with the simplicity of the laboratory buildings, the good design and well finished interiors with good equipment without any frills. I was also much impressed with the character of the problems that these people are working upon, problems of great moment and that cannot be solved in a day. The workers seem to be in a congenial and contented atmosphere as a result of the present method of joint financing of their work. The workers do not get high salaries and do not have large funds to work with. The laboratories are much simpler and the equipment not so extensive as ours, but it seems to be ample for their needs. Evidently the English investigators in horticultural lines are burdened with much less correspondence than are we. During the war period a sort of steering committee or reserve council was formed for determining the problems to be worked upon. There is a group of men at each of the institutions, together with directors of each of the stations and some of the scientific workers, forming a reserve council which cooperates with the Minister of Agriculture in planning and carrying out the work at each of the stations.

At the Rothamstead station located in Harpenden, England, the investigational work is organized in two groups under separate administration and having separate laboratory buildings. The first group is concerned with the continuance of the plot work and horticultural work of Laws & Gilbert the early founders of the station. The second group is made up (1) af a group of pathologists working on soil fungi; (2, a group working upon soil insects and (3) a group working upon soil bacteria and also amoeba. The work is fundamental in character and seems very complete in scope with the exception that no nematode work is under way. The work of this famous laboratory is being devoted almost entirely to the problems of the soil.

Cambridge University School of Agriculture has the best location of any of the institutions visited in England. While the available area of

land is quite small the facilities are increased by access to a large orchard enterprise of some 1,400 acres owned by Thivers Sons, Ltd., which is located near Cambridge. This fruit plantation is unique in several particulars. In the first place the standard trees are headed very high and closely interplanted with small fruits making it impracticable to use power sprayers or any of the usual cultural implements. Prior to the war the cultivation was done almost entirely by hand, but small garden tractors are now being employed. Spraying is accomplished from a central plant.

Mains are laid $2\frac{1}{2}$ or 3 feet deep along the main roads, standpipes being brought to the surface every eighth row of trees. From these connections are made to temporary lines of pipes laid between the rows of trees. Long reached from each connected to these temporary pipes, 64 trees being reached from each connection. Fruit breeding work is being conducted on the property of Chivers Sons with strawberries, raspberries, currants, gooseberries, apples, and plums.

At Redding, England, are located the large vegetable trial grounds of Sutton & Sons. Here 80 acres are devoted to tests of special strains and selections, crosses and hybrids. Tests are also made of the stocks being distributed. One important line of work being done is the development of select strains of beets made by Prof. Batsen to overcome the habit of "running to seed" the first season. Some of Prof. Batsen's selections showed no "shooters," while commercial seed varied from 10 to 80 per cent "shooters." Variety improvement at the horticultural trial grounds of Sutton & Sons is based on the progeny of a single plant, no mass selection being practised.

Paris, of course, is the horticultural center of France as is London of England. The great markets of Paris are very interesting. Several blocks right in the center of the City are devoted to great open sheds under which all sorts of farm produce are offered for sale and to one who is not accustomed to European conditions these markets appear congested and poorely arranged.

The chief feature from a horticultural standpoint in the immediate vicinity of Paris is the extensive trial grounds of Vilmorin-Andrae Company. This firm has great warehouses covering approximately five acres which are located right in the city of Paris where there are also small trial grounds and greenhouses in which trials are made and where some small plants, particularly flowering plants, are grown under glass for their seed. Very complete testing laboratories for working out the purity and germination of seed are maintained. The Vilmorin people make very careful germination tests, whole system of handling the seed is, I should say, very modern. Some of the buildings constituting the warehouses are old, but they have been tied together by systems of conveyors and passageways, so that the seed is delivered and mailing rooms.

The Vilmorin trial grounds and farms are about 15 miles outside of the city of Paris at the old Vilmorin estate which is a very large tract of land probably in the neighborhood of 750 acres being included in the trial and seed grounds.proper. Like all French homes the house, I suppose they call it a villa, is behind a great wall about 12 feet in height without any opening in it except the gate. Behind this wall we find a magnificent garden, trial

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grounds and headquarters for the breeding establishment where wheat breeding has been carried on for over 100 years, the work being started by one of the elder Vilmorins. They have a group of scientists located right on the home estate with laboratories and cottages and proper storage facilities for handling grains, seeds, etc. The garden around the Vilmorin villa is the richest in species of plants of any in the vicinity of Paris. It is quite large, is laid out very attractively and growing in it are exotic species from all over the world. A fine lawn not of great extent, probably 200 feet in diameter, is flanked all the way around by beautiful trees. The labeling is quite complete. Beyond this garden one goes direct into the more extensive breeding and trial grounds.

One of the features of the trial ground which the Vilmorins have maintained for upwards of 100 years is what they call their potato school, which is not a school at all, but simply a collection of the standard varieties of potatoes. I saw potatoes in which the same varieties and stock have been maintained for over 65 years. The collection is made up of something like 100 varieties which have been of interest to them, either from the standpoint of their economic importance or from the standpoint of breeding.

The tomato trials are carried on out of doors, the plants set about a meter apart each way and staked up, the work being carried on in a very nice way. The French are interested in two distinctive types of tomatoes which they recognize as adapted to two uses. First, the medium size small tomato like we grow in this country, which are used as fresh or table tomatoes, the other, a tomato of good size which will give a great tonnage for pulp purposes. I do not mean large in the sense of Ponderosa, but those having a diameter of $3\frac{1}{2}$ inches, rather flat, somewhat irregular in shape, but a heavy yielder of catsup stock. The newer American varieties as well as our standard varieties are well represented in the collection.

Sugar beets are an important factor in the Vilmorin enterprise. Stock beets are not so important as in England. The various crops under test are grown in rows with the rows blocked together, for example, a sample of seed is taken from each lot that is delivered by the growers and this with other samples of the same variety is planted in a block for comparison.

Herticultural features of special interest about Paris besides

the Valmorin estate are the nurseries in the various outlying towns and
the horticultural school at Versailles. This school, founded on the site
of the old vegetable garden of Louis XV, I was told, is about 15 miles
west of Paris. It is interesting because it consists of a fruit garden
in which every plant is a trained plant, the vegetable garden is arranged
in four quarters surrounded by trained fruit trees. They also have a good
set of fairly modern forcing houses and fine palm houses. There is a
small enemical laboratory in the garden where they carry on their work
with fungicides. The school building proper is in a very good building
which is approached by a "nole in the wall," which is characteristic of
France and you pass through this opening in the wall and find a nice
dwelling and a court. On the opposite side of the court is the school
building, supplied with good lecture rooms, work rooms, collection of



fruit models, and things of this character that go along with a good horticultural school. I will have to digress to say that I saw no lecture rooms or laboratories in which there were benches on which fellows would be inclined to go to sleep. The benches were of the crudest kind and about as comfortable as the pews in our old country churches.

The fruit trees in these gardens are really wonderful. Pear trees 35 years old with trunks 4 or 5 inches in diameter are literally covered with pin feathers or fruit spurs and develop wonderful crops of fruit. The work of these gardens is done by both the boys and trained gardeners. The boys of the school do one kind of work one week and another kind the next week and so on for four weeks, four different kinds of work being done, fruit, vegetable, floriculture, and forcing work. The students are divided into groups so that each group spends a week every four weeks on one subject. I saw a collection of varieties of apples, probably 150 varieties in all, the trees of which were planted four feet apart each way. Every tree had been trained so that it occupied a space not much over a meter across. Here were growing 150 varieties of apples on a space not larger than two good sized rooms. This idea seems to run through French institutions and French nurseries. I believe that the French system of trained fruit growing is practical for anyone who has a small area of ground, but I do not believe that it has any place in our commercial fruit growing. I believe that we as horticulturists should give more attention to what France is doing in pruning. It is my belief that the reason that France is not suffering from pear blight, although it has appeared in their orchards, is the fact that the trees are so systematically pruned. Pruning is done throughout the growing season and just as soon as a shoot is sufficiently matured at the base it is cut back to three buds. One striking thing in French nurseries is that the trees they are propagating for sale to Frenchmen are almost universally on vegetatively propagated stocks. Cherrics and plums are partly propagated from cuttings, pears are almost universally propagated on the Angers quince. Plums, cherries, and peaches for home planting are very largely double worked, all of the standards being double worked and all of those that are to be grown for cordon, espalier, or walls are on roots other than their own. The growing of French seedlings for stocks is done largely by market gardeners on a small scale. Growers in general told me that the seed from which they grow these stocks comes from the cider mills of Normandy. They said that these cider apples are grown in orchards composed of from 3 to 6 varieties, that the seeds are actually cross fertilized, thus giving first generation hybrids of extreme vigor insuring vigorous stocks. This is one line of argument that is put up for the use of these mixed seed which comes from the blending of cider apples, but I do not know how much value it has. In each locality a few grower dealers get together all of the fruit stocks grown by the local people and assemble them for sale. These are the people that the American nurserymen deal with.

We do not get very much of the vegetatively propagated stock here. The English use the dwarf broad leaved English Paradise for their standards. They do not use free stock or seedlings to any extent. Whether there could be any scheme worked out by which our nurserymen could provide their own supply of vegetative stocks I do not know. The English are attempting to do that, but the English trade demands one tree where the American trade demands perhaps anywhere from 100 to 200 trees. English people and English nurseries are solving their problems very satisfactorily for themselves,

which are not our problems at all. I do not mean to say that there is not much to be learned from the American fruit growers standpoint, but we cannot take English practices and transplant them unless the practice be adapted to our conditions. I am very greatly impressed with the importance of more uniformity in the root system of trees. Just how the problem is to be solved I do not now know and it is a question for considerable investigation. Those who are conducting investigations and experimental work along physiological lines or careful fertilizer tests should be as careful in choosing trees with uniform roots as tops. Vegetatively propagated stocks, all from the same mother plant, upon which scions from a common mother plant is used will I believe provide a basis for such work and will make it much more dependable than any yet done in this country.

At some future time I will endeavor to tell you something about Oxford and Cambridge. We have nothing on this continent that is anything like these institutions. Some of the old buildings go back to about the year 900 A. D. The universities themselves are made up of a large number of colleges, each college being built around a church. The lecture halls are minor affairs. The rest of the college is made up of the living quarters for the students. It is one of the striking illustrations of the influence of modern religion upon the education of the world.

THE GARDEN "HABIT" AND THE FOOD SUPPLY.

Home vegetable gardens have been an important factor in solving the food problem during the season of 1920 and greater quantities of vegetables have been canned or stored for winter use than usual. This has a very direct bearing upon the welfare and net income of the people. The extension workers in many of the States gave special attention to the home garden movement and, in our judgment, the value of such work justifies even greater attention being given in the future. The garden "habit" seems to have become permanent with a large number of industrial workers and we find the greatest neglect of the garden is not in and around the cities but on the farms. This is especially true through the corn belt and the cotton belt and in other sections where specialized farming is practised. In view of the fact that interest in the home vegetable garden, and in many cases the labor also, is supplied largely by the women, any effort to stimulate the planting and care of gardens should be promoted largely through the home demonstration agents. In the conduct of this work, however, the county agents and the club activities should not be overlooked.

There is perhaps no single feature of the farm that effects the welfare of all members of the family as does the home garden. The home orchard is important and in a number of the States special home orchard campaigns have been conducted. These demonstrations include the selection of the proper location, planting and the general care of a home fruit orchard. In South Carolina, for example, we find a large number of home orchards that are now two to four years old and which are well pruned, sprayed and cared for and that stand as monuments to the extension work. The home garden is extremely important and by far the greatest factor in the health and economy of

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the family, but the home orchard is also important from the standpoint of improving the aesthetic and environmental conditions of country people. Unfortunately the awakening of interest in fruit tree planting comes too late in fife for most of us and with the idea of getting the younger generation to realize the importance of laying the foundation for the pleasure that comes from having one's own fruit plantation, it is essential that this work be done with the boys and girls through the club organizations. Too much stress cannot be laid upon the importance of developing the fruit clubs in those States where suitable conditions exist. In the meantime, however, let us not forget the importance of encouraging the planting and care of more and better home vegetable gardens.

This year almost 1,000 hashington families enjoyed the privilege of cultivating a home garden located on reclaimed land along the Potomac. Incomplete reports show that 53,000 cans of vegetables were put up by these families in addition to the vast quantities used during the summer or stored for winter use. The market value of the products of each of these gardens was approximately \$65.00 or about \$850.00 per acre. The money value, however, is the least of the benefits that have accrued from these gardens for the recreational opportunities and the improved health of the gardeners, and of the 10,000 people who constituted their families and neighbors who have benefitted has been far greater than the actual gain from a money standpoint.

The records show that approximately 65 hours labor were devoted to the cultivation of each garden, the returns being on the basis of 1.00 an hour. This is a remarkable showing when it is considered that the time spent in the gardens would otherwise have been wasted and in many instances a financial drain upon the family resources.

A brief description of the methods employed in organizing the community garden work in the District of Columbia may be of interest. Supervision of the work has been furnished by the Agricultural Agent for the District, who functions the same as a county agent. This agricultural agent is supported and directed by the District Council of Agriculture and the Office of States Relations Service South cooperating. The gardeners are organized in local clubs each having its officers and committees for handling the necessary finances and arranging for plowing the land, laying off the plots and policing the gardens. The Agricultural Agent is the court in cases of dispute and also passes upon the quality of the work done by the gardeners.

What is true of Washington's garden movement is also true in a great many other cities. The need for stimulation in the planting and care of gardens, however, lies mainly with the farmers who for one reason or another are neglecting this important adjunct to their living. It is needless to say that the farmer who has at least a couple of good cows and a few pigs and a garden does not have to go far from his own door for the major portion of his living. Our duty as extension horticulturists lies with the promotion and development of the vegetable and fruit supply for the family and the more nearly this can be placed upon a permanent basis the better.

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FRUIT AND VEGETABLE INSPECTION IN CLUTIONIVA.

Pruit and vegetable inspection service by the State of California Department of Agriculture is meeting with a most favorable reception on the part of the growers and shippers. This inspection is on a cooperative basis between the State Department of Agriculture and the Eureau of Markets. Shipping point inspection is provided, especially on oranges, grapefruit, grapes, celery and lettuce. Certificates as to the quality and condition of the products inspected are prima facie evidence in any court in the State and thus provide the shipper with a definite protection in case of attempted rejection or railroad claims. In the case of a car of Tokay grapes on arrival of car the concern to which the shipment was made wired a demand for a reduction in price of 35 cents a box or \$375.00 on the entire car. If the shipper had not had the State inspection he would have been compelled to accept settlement on the basis of the allowance demand.

Another result of the State inspection service is the standardizing of trade terms used by the different shipping sections. The cost of this inspection is about \$\\ \psi_0.00\$ a car and the movement is meeting with the approval of the shippers and cash buyers. Whenever a buyer purchases for cash, bank guarantee basis, the state inspector will, upon request of the buyer, send a collect wire giving a brief summary of his findings so that this may be received before sending the bank guarantee; an inspection certificate will be issued in all cases as well.

How Extension Horticulturists can Cooperate with Boys' & Girls' Club Leaders.

Club leaders in many of the States are just now making plans for next seasons work and no better opportunity will be offered for extension horticulturists to be of assistance in shaping the policy of this important work. Certain phases of both fruit and vegetable production are well adapted for club activities. These differ in the several states and those who are directing extension activities in horticulture are in best position to advise the particular phasesthat are adapted to local conditions. Certain of the garden vegetables have formed the basis for much of the club work with girls in the Southern States and recently Muscadine grapes, figs and other fruits have played an important part. Potato clubs have been organized in most of the prominent potato producing sections. Among the fruits apples, peaches, strawberries and raspberries have furnished a working basis for club activities.

All extension workers in horticulture are urged to get in touch through the profer channels with the club leaders in their respective states and plan with them for putting on at least one horticultural club project for both boys and girls. Foo much should not be undertaken at first but the work should be well thought out and then carried through to completion in a manner that will cause the idea to spread to other communities. Irish potatoes and sweet corn for the market are two of the best crops for club work in the north while sweet potatoes and peanuts are good in the south. Strawberries, blackberries and grapes are excellent as fruit crops. Extension specialists can be of the greatest help in providing cultural directions

Potato Judging Contest at Iowa Vegetable Growers Association.

What was probably the first official potato judging contest was put on at Council Bluffs, Iowa during the meeting of the Iowa Vegetable Growers Association, November 17th to 19th. The contest was participated in by student teams, of three members each, from the Iowa and Missouri Colleges. Prof. Wm. Stuart, potato expert of the Department, served as one of the judges. The score was based on 100 points and the team from Missouri won by about 3 points. The test included six commercial varieties, four lots of each. For placing 50 points, reasons for placing 40 points and identification 10 points. Identification was based on a mixed lot of 50 tubers including the 6 commercial varieties.

Potato judging contests promise to be a feature of horticultural exhibits in the future and are especially desirable for stimulating interest in the improvement of potatoes.

Students Horticultural Exhibit.

Oh say: isn't that fine. Where did they get all those fine apples and such large sweet potatoes. It would be difficult to say who was wearing the broadest smale, President Woods or Extension Director Symons of the University of Maryland. The occasion was the first annual horticultural exhibit made by the horticultural students of the Maryland University at College Park, Maryland. Those in charge of the Horticultural work of the institution and the students are to be highly commended not only upon the character of the exhibits but also upon their skill and good taste employed in the staging and arrangement of the exhibits. Do it again boys and may you beat your own record.

Special Notice.

Do not forget the meeting of the American Society for Horticultural Science in Chicago at the Atlantic Hotel December 29, 30 and 31. One, or perhaps two, sessions will be devoted to a discussion of extension matters. The meetings of the American Society for the Advancement of Science will be on during the same week and double opportunity for meeting the workers will be afforded.

- W. R. Beattie,
 Extension Horticulturist.
- C. P. Close,
 Extension Pomologist.